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# MULTIMEDIA UNIVERSITY

## SUPPLEMENTARY EXAMINATION

TRIMESTER 1, 2015/2016

**PSP 0101 – PROBLEM SOLVING AND PROGRAM DESIGN**  
(Foundation in Information Technology)

18 NOV 2015  
9.00 AM – 11.00 AM  
(2 HOURS)

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### INSTRUCTIONS TO STUDENTS

1. This question paper consists of **THREE** pages excluding the cover page.
  2. Answer **ALL** questions.
  3. Write your answers in the Answer Booklet.
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**Instructions:** Answer **ALL** questions. Write your answers in the Answer Booklet.

**QUESTION 1 [25 Marks]**

- a. List the **FIVE** phases in System Development Life Cycle (SDLC). (2.5 marks)
- b. List the **SIX** phases in Program Development Life Cycle (PDLC). (3 marks)
- c. There are two types of problems: algorithmic, and heuristic. Explain both, and give an example for each type of problems. (4 marks)
- d. Using proper variable names and computer operators, set up an equation to calculate each of the following:
  - i. Convert temperature in Celsius to Fahrenheit. Given  $F = C \times \frac{9}{5} + 32$
  - ii. The inner and outer surface areas of an open cubic box (the box has no cover). The height of the box is  $h$ .
  - iii. Find the average of three numbers.
  - iv. The entrance fee to an amusement park is as below:  
Adult RM 20, Children RM10, Senior Citizen RM12

Write an equation to find out how much is the total cost to enter the park if there are A number of adults, C number of children and S number of senior citizens.

(15.5 marks)

**QUESTION 2 [25 Marks]**

- a. Write a complete flowchart using negative logic structure for a program to calculate a user's age automatically when the given inputs are current year and born year. The program can determine a user's favourite snack based on his/her age. Refer to **Table 1** below:

Age (year)	User	Favourite Snack
0 – 1	Baby	Yogurt
2 – 17	Kid	Potato Chips
18 – 60	Adult	Chocolate
> 60	Senior	Ritter Sports

**Table 1**

(17 marks)

**Continued...**

- b. Using proper variable names and computer operator, create an IPO chart to calculate how many pirates you could hide in each barrel, when given as an input are number of pirates and number of barrels.

(8 marks)

### QUESTION 3 [25 Marks]

- a. Nancy sells her handicrafts online. She wants to write a program that enables her to key in all her sales amount (in US \$) every day and then outputs the total sales for that day. Since the number of items sold every day is different, she will not know in advance how many items are sold for each day. Therefore she uses a special number, -999, to indicate that there are no more items to enter. Write the pseudocode for this program. Two sample runs of the program are given below.

```
Enter sales: 35.99  9.95  10.50  79.30  -999
Total sales: 135.74
```

```
Enter sales: 79.30  10.50  12.99  8.95  35.99  10.50  -999
Total sales: 158.23
```

(4 marks)

- b. Draw a corresponding flowchart for the program in Question 3(a).

(8 marks)

- c. The Republic of Alès is revising its electricity billing structure to the following: \$0.10 per unit for the first 10 units, \$0.15 per unit for the next 10 units, \$0.20 per unit for the next 20 units, and \$0.30 per unit for the rest. Draw a flowchart using the positive logic structure for the calculation of the electricity bill for any household.

(13 marks)

**QUESTION 4 [25 Marks]**

- a. Mr. James has 10 employees in his company who are paid based on their working hours. Write a pseudocode for a program that will ask him to key in the hourly rate and then in a loop, he will key in the number of hours each of his employees has worked. The program should also be able to calculate and display the respective salary of his employees. Your pseudocode should be using array that is based on automatic-counter loop. (7 marks)
- b. Draw a flowchart to support your answer in Question 4 (a). (7 marks)
- c. What is the difference between local variables and global variables? Referring to Figure 1 below, list the local variables and global variables.

Variables: Price, DiscountRate, OriPrice

Read Module  
Variables: ThePrice, TheRate

Calculate Module  
Variables: ThePrice, TheRate, Price

Print Module  
Variables: Price

**Figure 1**

- d. Write a pseudocode for a function definition that will the display the total price a guest has to pay by multiplying the number of night spent at the hotel and the price per night. The function should have two parameters. (5 marks)